Shaping Mock Juror's Judgements: The Role of Individual Differences in Disgust Sensitivity and Valence Weighting Bias

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Abstract

Jurors vary in their attitudes and biases related to criminal cases. Given high conviction rates in the U.S., it is important to understand factors that shape jurors' attitudes and ultimate punitiveness. Disgust sensitivity, the extent to which individuals experience the emotion of disgust, and valence weighting bias, an attitude generalization process, both may play an important role in shaping jurors' decisions. Across two studies we find consistent evidence to support the idea that individuals characterized by greater disgust sensitivity tend to have more punitive attitudes. Valence weighting bias showed inconsistent effects on juror bias, a finding we believe should be explored in more detail in the future. This research suggests that disgust sensitivity plays an important role in shaping jurors' attitudes, with individuals high in disgust sensitivity being more likely to reach punitive judgments about potential criminals.

Introduction

Each year thousands of Americans are selected to serve on a jury and are often tasked with deciding a defendant's guilt. Finding a completely neutral juror, however, is particularly difficult given that individuals' inherent biases, preferences, and attitudes will inevitably impact their decisions. Juror attitudes have been discussed in relation to race (Mitchell, Haw, Pfeifer, & Meissner, 2005), religion (Miller, Maskaly, Green, & Peoples, 2011), gender (Quas, Bottoms, Haegerich. & Nysse-Carris, 2002), and other demographics that could influence a juror. However, relatively little research has focused on how broader attitude-related factors may play a role in juror bias. Valence weighting bias, an attitude generalization process, and disgust sensitivity, an individual difference, may play a significant role in juror decision making. These two variables have been correlated with political conservatism, with has in turn been associated with a tendency to be more punitive (Gromet & Darley, 2011). Thus, it is reasonable to hypothesize that valence weighting bias and disgust sensitivity may play a large role in juror decision making. This may be important, as valence weighting bias is most significant when individuals are dealing with novel or ambiguous scenarios, which frequently occur in court cases. Trials are inherently novel to individuals, as potential jurors who know details about the case are excluded from selection. Also, criminal cases include evidence that is especially ambiguous, as the defense and prosecution each frame the evidence in different ways. Thus, it is reasonable to expect valence weighting bias to play a role in juror decision making, due to the high ambiguity and exposure to new stimuli. In addition, trials can involve potentially disgusting stimuli such as photos of a crime scene, which could trigger disgust and affect juror decisions.

The literature on juror bias has traditionally focused on demographic characteristics and internal prejudices. Studies have found that racial bias plays a significant role in decision-making related to juries, where people of all races are more likely to be more punitive towards defendants of a different race than themselves (Mitchell, Haw, Pfeifer, & Meissner, 2005). Racial bias has been related to disgust sensitivity such that those with higher disgust sensitivity are more likely to show increased implicit racial bias (Liu, Lin, Xu, Zhang, & Luo, 2015). There are many factors involved in juror bias, from racial prejudices to distrust of the legal defense. While these specific biases play a role in juror decisions, another way to measure juror bias is looking specifically at punitiveness. A punitive juror is more likely to convict a defendant and to seek a harsh punishment. By investigating disgust sensitivity and valence weighting bias, it may be possible to identify jurors who are more likely to view defendants as guilty and thus be more punitive towards them.

Disgust is one component of a larger system known as the behavioral immune system. The behavioral immune system is theorized to have evolved along with our biological immune system, which combats harmful pathogens once they have entered the body. In contrast, the behavioral immune system helps individuals to avoid the pathogens altogether. Given that engaging the biological immune system is taxing to the individual, it is thought that the behavioral immune system evolved in order to conserve energy (Schaller, 2006; Schaller & Duncan, 2007; Schaller & Park, 2011). The behavioral immune system is comprised of three main components: an affective component, a cognitive component, and a behavioral component. The behavioral immune system triggers each of these components if a potential pathogen is detected. The affective response involves feeling an emotion such as disgust, the cognitive

response involves thoughts about the pathogen, and the behavioral response involves actions taken to avoid the pathogen. Our studies aim to further investigate the affective component, and how individual differences in disgust sensitivity may influence cognition and behavior.

While disgust is a universal emotion that all humans can experience (Ekman, 1970), individuals differ in the extent to which they experience disgust. Disgust sensitivity refers to the extent to which an individual experiences the emotion of disgust. Individuals vary in their disgust sensitivity, with some individuals being relatively high in disgust sensitivity while others are relatively low in disgust sensitivity (Haidt, McCauley, & Rozin, 1994; Tybur, Liberman, & Griskevicious, 2009). Those who are high in disgust sensitivity tend to experience disgust more frequently and for longer durations compared to individuals who are relatively low in disgust. Due to their higher reactivity to disgusting stimuli, individuals high in disgust sensitivity are usually more behaviorally avoidant when there is a potentially disgusting stimulus in the environment, and cognitions related to disgust and disease are more easily accessible in their memories (Druschel & Sherman, 1999).

The primary function of disgust is to help individuals avoid potential pathogens in their environments. For example, the idea of eating rotten food often can trigger the emotion of disgust, which leads to a decision against it, and stops them from potentially contracting diseases. However, people can feel disgust from a variety of stimuli, even stimuli not intended to be ingested. For example, individuals can become disgusted by blood, feces, trash, and other potentially contaminated materials. Even without ingesting these objects, close contact with them could result in diseases. Disgust can also be triggered by non-pathogen related stimuli. Individuals may feel disgusted when hearing about less traditional sexual behaviors, such as anal

sex, or even by moral transgressions, such as child pornography. Thus, while the initial and main responsibility of disgust is to avoid pathogens, it is theorized to have evolved to help people avoid potentially dangerous others who violate norms or may be a threat to one's in-group (Faulkner, Schaller, Park, & Duncan, 2004). A potential explanation for why racism is correlated with disgust sensitivity is that those with higher disgust sensitivity may be more likely to view other races as out-groups and thus be motivated to avoid them. Evolutionarily, avoiding out-groups may have prevented people from coming into contact with unfamiliar diseases, so prejudice may have aided in survival by encouraging avoidance of other groups. Past research has shown that disgust sensitive individuals are more likely to identify with conservative political beliefs, have more racial bias, and believe that the world is a dangerous place (Inbar, Pizarro, Iyer, & Haidt, 2012).

Valence weighting bias refers to an attitude generalization process in which known negative attitudes and known positive attitudes are generalized to novel stimuli. Individuals differ in their valence weighting tendencies such that those with a positive valence weighing bias tend to generalize their positive attitudes and weigh more heavily the positive features of a novel stimulus, and those with a negative valence weighting bias tend to generalize their negative attitudes and weigh more heavily the negative features of a novel stimulus (Pietri et al, 2013a). Valence weighting bias has been shown to remain stable over time, and to predict a variety of behaviors. Individuals with a positive valence weighting bias tend to explore novel environments more and often display more approach-oriented behavior, whereas individuals with a negative valence weighting bias tend to display more avoidant behaviors (Rocklage, Pietri, Fazio, 2013b). Valence weighting bias has also been linked to disgust sensitivity, where those with higher

disgust sensitivity are more likely to have negative valence weighting biases (Boggs, 2019). This relationship is not surprising, given that negative valence weighting bias and high disgust are both strongly associated with avoidant behaviors.

Valence weighting bias can be assessed through a computer paradigm called Beanfest. In this paradigm individuals first learn which novel stimuli are positive and which are negative, and then evaluate yet other novel stimuli that vary in their resemblance to the earlier learned positive and negative stimuli. Thus, the paradigm measures the extent to which individuals generalize their known attitudes to the novel stimuli. In this game, the stimuli are virtual beans that vary in shape (circular to oblong) and number of speckles. With a matrix of ten levels for shape and ten for speckles, there are 100 beans overall that will be presented to participants. Each bean is either negative or positive, depending on where it falls on the shape/speckle axis.

In the first part of the game, the learning phase, participants are shown 36 beans that are taken from 6 regions of the matrix. Participants aim to increase their point score to 100 and avoid decreasing their total score to 0. They do this by selecting the positive beans (each worth 10 points) while not selecting the negative beans (worth -10 points). During the learning phase, if the participant selects a bean, the bean's value is revealed, and their point score will change. If they do not select a bean, the bean's value is still revealed, but their score does not change. The participants' score is shown at the bottom of the screen, allowing participants to know whether they selected a positive bean or a negative bean. This is important because participants will have never played Beanfest before and will have no prior knowledge of the stimuli, thus in the learning phase, participants begin developing attitudes towards the beans. In the second phase, the game phase, both the beans from the learning phase, as well as novel beans are presented,

and participants must categorize each bean as harmful or helpful in regard to point score. Participants' valence weighting bias is calculated as the average response to the 64 novel beans, controlling for learning of game beans (Fazio, Pietri, Rocklage, & Shook, 2015).

Valence weighting bias may be related to juror bias, as trials will frequently involve novel or ambiguous scenarios. Many court cases will involve the defense and prosecution offering opposing arguments, with no clear-cut winning argument. Jurors have to integrate these arguments and attempt to form an unbiased opinion of whether the prosecution or defense has a stronger case. This is relevant to valence weighting bias because valence weighting bias affects how individuals form attitudes about these new or ambiguous situations. Individuals with a negative valence weighting bias might be more likely to feel negatively towards the more ambiguous aspects of the trial, which will inevitably affect their final decision. In addition, negative valence weighting bias has been previously associated with high disgust sensitivity (Boggs, 2019), which has in turn been correlated with political conservatism and with punitiveness (Jones & Fitness, 2008). For these reasons, we expect that individuals with a more negative valence weighting bias to be more likely to hold punitive attitudes towards the defendant, and thus be more prone to conviction.

The major aim of our studies is to replicate and expand upon the correlation between juror bias, namely punitiveness, and disgust sensitivity. In addition, we hypothesize that negative valence weighting bias will be associated with both higher disgust sensitivity and more punitiveness. In Study 1, the goal is to explore these correlations and establish relationships. The purpose of Study 2 is to replicate these findings in a more real-world setting and investigate the efficacy of using a series of crime-related vignettes to measure punitiveness.

Study 1

Methods

Participants

In Study 1, 109 participants were recruited online through Amazon Mechanical Turk. Participants were 51.4% male, 45.9% female, and 1.8% other or prefer not to answer. The majority of participants were White/Caucasian (80.7% White/Caucasian, 11.1% Black/African American, 4.4% Asian, 0.9% Other, 0.9% Prefer not to answer, and 0.9% American Indian or Alaskan Native). The average age of participants was 36.13, with a standard deviation of 10.25 and range from 22 years old to 68 years old. Each participant was compensated $5.00 for completing the hour-long survey.

Procedure

Participants were recruited through Mechanical Turk and were instructed to complete an online consent form. When they registered their consent to participate in the survey, participants played Beanfest. After completing Beanfest, participants completed a number of measures, including the Three Domain Disgust Scale (TDDS; Tybur, Lieberman, & Griskevicious, 2009), the Pretrial Juror Attitudes Questionnaire (PJAQ; Lecci & Myers, 2008), and various basic demographic variables. They were finally thanked for their participation and given a code to enter to receive their compensation.

Beanfest. Valence weighting bias was measured through Beanfest, a game that measures individual differences in valence weighting (Fazio, Eiser, & Shook, 2004). As discussed previously, Beanfest is a computer paradigm that involves participants choosing to either select or not select a virtual bean. By selecting a bean, participants are taking a risk that they may lose 10 points if the bean is 'negative', but they may gain 10 points if the bean is 'positive'. If the participant opts to not select a bean, they will have no change in score. The beans differ along a spectrum of circular to oval shape and by number of speckles. In the first phase, participants are shown a portion of the beans and must learn which types of beans add points, and which types of beans subtract points. During this phase, participants are given visual feedback of their point score, so they can form attitudes towards the beans and begin to understand which beans are 'positive' and which are 'negative.' In the next phase, participants are shown all of the 100 beans and must again choose to either select or not select each individual bean. Finally, the participant's valence weighting bias is calculated as their average response to the beans that were not previously shown in the learning phase, controlling for their learning of those original beans. This is done with a regression equation that predicts a participant's average response to the novel beans from the proportion of positive game beans and the proportion of negative game beans that the participant classified correctly. This is important because, for example, if a participant learned the positive beans better than the negative beans, they would categorize more novel beans as positive. By controlling for this learning, a more accurate measure of valence weighting bias is computed (see Fazio et al., 2015, for details).

Three Domain Disgust Scale. Participants completed the Three Domain Disgust Scale (TDDS; Tybur, Lieberman, & Griskevicious, 2009). This scale measures individual disgust

sensitivity in three different domains, which sum to create an overall disgust sensitivity score. The domains consist of pathogen disgust, sexual disgust, and moral disgust. The scale includes 21 items, with 7 items for each subscale. Participants rate their disgust for each item on a scale of 0 (Not at all disgusting) to 6 (Extremely disgusting). Items include statements that describe scenarios relating to disgusting stimuli in each of the three domains. For example, an item related to pathogen disgust is "stepping on dog poop," an item related to sexual disgust is "performing oral sex," and an item related to moral disgust is "deceiving a friend." An overall disgust sensitivity score is created by averaging all 21 items, and each subscale is computed by averaging the seven relevant items for each domain. Higher numbers represent greater sensitivity to experiencing disgust. In this study, moral disgust was not used, due to its generally lower validity and power when compared to pathogen and sexual disgust. Thus, 14 questions from the sexual and pathogen disgust subscales were presented.

Pretrial Juror Attitudes Questionnaire. Next, participants completed the Pretrial Juror Attitudes Questionnaire (PJAQ; Lecci & Myers, 2008). This 29-item questionnaire was created to measure various forms of juror bias, represented by six subscales. Items are statements about criminal justice related topics, and the participants indicate their agreement on a scale from 1 (strongly disagree) to 5 (strongly agree). An overall score consists of an average of all 29 items, and each subscale is computed by averaging the items relevant to each form of bias. The six subscales are conviction proneness (e.g., "A defendant should be found guilty if 11 out of 12 jurors vote guilty,") system confidence (e.g., "If a suspect runs from the police, then he probably committed the crime,") cynicism towards the defense (e.g., "In most cases where the accused presents a strong defense, it is only because of a good lawyer,") racial bias (e.g., "Minority

suspects are likely to be guilty, more often than not,") social justice (e.g., "Famous people are often considered to be 'above the law,'") and innate criminality (e.g., "Men are more likely to be guilty of crimes than women.") After reverse scoring the necessary items, a higher score on each subscale reflects more bias in that area. For example, a higher score on the racial bias scale indicates more racially biased attitudes. A higher overall score, when totaling the subscales, reflects a higher likelihood of being biased towards convicting the defendant.

The final measures that participants were asked to answer were a variety of demographic questions. This included political party affiliation, political orientation, age, gender, race, income, education, and socioeconomic status.

Results

Descriptive statistics, Cronbach's alphas, and correlations between all measures are presented in Table 1. Our hypotheses that higher disgust sensitivity and more negative valence weighting bias would correlate with higher punitiveness on the Pretrial Juror Attitudes Questionnaire were partially supported. Overall disgust sensitivity was significantly and positively correlated with the PJAQ (r= .448, p< .001), and all six PJAQ subscales. Of the measures from the Three Domain Disgust Scale, sexual disgust was the most strongly correlated with the PJAQ (r=.485, p<.001). However, valence weighting bias showed no significant correlations with disgust or the Pretrial Juror Attitudes Questionnaire.

Discussion

The results of Study 1 provided strong initial evidence of a relationship between disgust sensitivity and punitiveness, replicating previous literature (Stevenson, Malik, Totton & Reeves,

2015). Although the Pretrial Juror Attitudes Questionnaire has never been used in conjunction with measures of disgust sensitivity, it correlated significantly with the Three Domain Disgust Scale, as did its subscales. However, each subscale measures a different aspect of juror bias, such as racial bias or system confidence, so our study primarily focused on the overall PJAQ score, as we were most interested in punitiveness. While using the overall PJAQ score as a predictor of punitiveness seems to be an effective measure of juror bias, it may be useful to transition to a measure that more directly measures punitiveness.

Valence weighting bias unfortunately did not correlate significantly with any of our expected variables. While we expected negative valence weighting bias to be associated with higher disgust sensitivity and a higher score on the PJAQ, this was not found to be the case. The Pretrial Juror Attitudes Questionnaire may not have involved enough ambiguity or novel situations for valence weighting bias to have become relevant, as people's attitudes about the criminal justice system-related statements may have been already formed and easily accessible.

Study 2

The purpose of Study 2 was to attempt to replicate the correlations between disgust sensitivity and punitiveness, and to investigate a different way of measuring juror bias. The PJAQ is a useful measure when used as an average, but we were less interested in its numerous subscales, as our study intended to focus specifically on punitive attitudes. In addition, a questionnaire assessing general beliefs may not be the most realistic way to measure juror bias. Past literature has used vignettes describing crimes, and asked participants to act as mock jurors when making decisions about the vignettes (Jones & Fitness, 2008). Using vignettes may be especially useful as it is more of a simulation-based measure; participants have to mentally

simulate the scenario and then make a judgement. This may be a more realistic approach as it directly reflects what jurors must do in a court room. By having participants judge multiple vignettes, it is also possible to investigate how jurors might punish, on average, a variety of crimes, differing in the nature of the offense and in severity. This is a more ecologically valid approach to measuring punitiveness and may result in stronger relations than the PJAQ, which relied on participants' rating their agreement to a variety of bias-related statements.

Methods

Participants

In Study 2, participants were 164 Mechanical Turk workers (33.5% female, 62.2% male, 0.7% other). The mean age was 40.03, with a standard deviation of 11.23 and range of 23-71 years old. Participants were 73.8% Caucasian/White, 10.4% Asian, 10.1% Hispanic, 4.3% African American/Black, 1.8% Other, 1.2% American Indian or Alaska Native, and 0.6% preferred not to answer. Each participant was compensated $5.00 for completing the hour-long survey.

Procedure

Participants were recruited through Mechanical Turk and were instructed to complete an online consent form. After they registered their consent to participate in the survey, participants played Beanfest. Participants then rated a series of 14 crime-related vignettes with respect to how severe the action was, and how severely the person should be punished. They then completed a number of measures, including the Three Domain Disgust Scale, the Pretrial Juror Attitudes

Questionnaire, and various basic demographic variables. They were finally thanked for their participation and given a code to enter to receive their compensation.

Beanfest. Beanfest was used to measure participants' valence weighting bias again, with no changes to the procedure from the first study.

Crime-Related Vignettes. Vignettes were created to each briefly describe a crime, with the levels of severity of the crimes varying significantly. Limited information about the actor of the vignette was given, in order to prevent third variables such as race or age from influencing mock jurors' decisions. A combination of male and female names was used to attempt to prevent gender from influencing participants. 21 vignettes were initially piloted on Amazon Mechanical Turk (n= 51) in order to choose fourteen of the most ambiguous for Study 2. Pilot participants were asked to rate each vignette for (1) how severe the actions of the actor were and (2) how severe the actor's punishment should be. Fourteen of the vignettes were selected for use in Study 2 based on the pilot data, with a broad range of mean punishment ratings (from 2.6 to 5.4). The most ambiguous situations were chosen as they were the most likely to show individual differences in punitiveness. Ambiguity was approximated by analyzing the standard deviations of participants' ratings. More ambiguity was assumed to be associated with higher standard deviations, as this suggested that participants showed lower agreement with each other when rating the vignette. The fourteen vignettes chosen for Study 2 and their descriptive statistics are presented in Table 2. An example of a vignette used is "Richard has been entrusted with thousands of dollars to invest for his clients. He uses a portion of their funds to buy himself a new car instead of investing the money as he promised." This vignette depicted a more serious offense, and pilot participants ranked it as deserving the most severe punishment on average. A less serious crime-related vignette example is "Theresa is addicted to heroin, and she regularly

purchases from a dealer on her street. She takes the heroin back to her house to inject it without any other people around." This vignette received the lowest ratings for punishment, indicating participants did not want to harshly penalize Theresa's behavior.

After reading each of the 14 vignettes, participants in the actual study were asked to rate the severity of the actions and the severity of proposed punishments on a scale of 1 to 7. Given that the punishment ratings and the action ratings were highly correlated (r=.862, p<.001), an overall punitiveness measure was created by averaging together both the punishment and action ratings. Higher numbers on this measure indicate more punitive judgments.

Three Domain Disgust Scale. The Three Domain Disgust Scale was then administered, and in this study all three domains were included: pathogen disgust, sexual disgust, and moral disgust.

Pretrial Juror Attitudes Questionnaire. The Pretrial Juror Attitudes Questionnaire was also included again, to attempt to replicate findings from Study 1 in which disgust sensitivity and the PJAQ were significantly associated. In addition, we aimed to examine whether the vignette ratings and the PJAQ would correlate in the expected direction, which would suggest that they both successfully measure punitiveness.

Results

Descriptive statistics, Cronbach's alphas, and correlations between all measures are presented in Table 3. The findings from Study 1 were partially replicated. We expected disgust sensitivity to correlate with more punitive ratings on the vignettes. From the Three Domain Disgust Scale, pathogen disgust (r= .421, p<.001), sexual disgust (r= .282, p<.01), and moral disgust (r= .442, p< .001), were all positively and significantly correlated with overall

punitiveness from the vignettes. Further, overall disgust sensitivity was also associated with punitiveness ratings ($r = .512$, $p < .001$).

Replicating Study 1, disgust sensitivity significantly and positively correlated with the Pretrial Juror Attitudes Questionnaire ($r = .391$, $p < .001$) and with some of the PJAQ subscales. All three of the TDDS subscales were also significantly correlated with the PJAQ. The PJAQ also positively and significantly correlated with the vignette measure of punitiveness ($r = .319$, $p < .001$) which suggests that both measures were measuring punitiveness as intended.

Valence weighting bias was significantly correlated with the vignette ratings ($r = .224$, $p < .01$) such that individuals with a more positive valence weighting bias showed greater punitive attitudes on our crime vignette measure. In contrast to Study 1, valence weighting bias was significantly correlated with the PJAQ ($r = .184$, $p < .05$), and the PJAQ System Confidence subscale ($r = .215$, $p < .05$). This suggests that the relationship between valence weighting bias and the PJAQ may be primarily driven by the system confidence subscale. In sum, individuals with a positive valence weighting bias showed more punitive attitudes and greater trust in the criminal justice system as an institution.

Additionally, and in contrast to the findings of Boggs (2019), valence weighting bias was significantly correlated with the Three Domain Disgust Scale ($r = .195$, $p < .05$) and TDDS' sex subscale ($r = .168$, $p < .05$), such that greater disgust sensitivity was associated with more positive valence weighting bias. Valence weighting bias was not significantly correlated with either the pathogen or the moral subscale.

Discussion

As expected, disgust sensitivity was, once again, highly predictive of punitiveness. When using the vignettes, which seem to be a more natural and effective method of measuring punitiveness than a questionnaire about general beliefs, disgust was significantly associated with higher ratings of severity for both punishments and actions. In fact, disgust sensitivity was more strongly related to punitiveness than was the Pretrial Juror Attitudes Questionnaire, which was created for the purpose of predicting punitive judgments. Although higher disgust sensitivity once again correlated with higher punitiveness on the PJAQ, the vignette ratings yielded stronger correlations with disgust sensitivity than the PJAQ did. This pattern suggests that the use of more vignette-based measures may offer a more useful means of assessing punitive attitudes.

The correlation between valence weighting bias and disgust sensitivity, such that individuals with a more positive weighting bias also showed higher levels of disgust sensitivity, was unexpected given prior research. This relation was contrary to the past literature (Boggs, 2019) suggesting that more negative valence weighting bias is associated with higher disgust sensitivity. In addition, positive valence weighting bias correlated with both higher punitiveness from our vignette ratings, and higher scores on the Pretrial Juror Attitudes Questionnaire, a result that directly contradicted our hypothesis. These findings are also inconsistent with Study 1, in which valence weighting bias displayed no significant correlations with either disgust sensitivity or punitive attitudes. Hence, these results from Study 2 must be regarded as tentative.

Nevertheless, one possible explanation for the unexpected relationship between positive valence weighting bias and punitiveness could involve the associations that have been observed between positive valence weighting bias, higher impulsivity, and faster decision making (Zunick, Granados Samayoa, & Fazio, 2017; Granados Samayoa, 2017). In situations where individuals

are likely to experience an immediate impulsive reaction, those with a more positive valence weighting bias are less likely to counter that impulse. Instead, these individuals are more likely to make decisions that correspond with the initial impulse. For example, in the Zunick et al. study (2017), a Stroop Color Word Task, which was designed to measure impulse inhibition, was administered to participants. Participants with a more positive valence weighting bias and lower self-control were more likely to struggle with impulse inhibition. They took less time to answer and committed relatively more errors on trials for which the font color and the color word were incongruent with one another. Thus, it may be possible that the crime-related vignettes evoked an initial impulsive reaction presuming guilt. As the actor in each of the vignettes was described as being undoubtedly guilty, those with a more positive valence weighting bias may have been more likely to accept this initial assessment of guilt. On the other hand, those with negative valence weighting biases may have countered their initial impulses with a more deliberate analysis of the vignette. In the future, vignettes should include scenarios that do not presume guilt, but instead include information suggestive of both guilt and innocence, which would increase ambiguity.

The relationship between positive valence weighting bias, high disgust sensitivity, and higher scores on the Pretrial Juror Attitudes Questionnaire were also unexpected. One possible explanation for these relations concerns the order in which the measures were administered. The vignettes followed Beanfest and preceded the other measures. The crime-related vignettes may have primed more punitive attitudes, which then were revealed on the Three Domain Disgust Scale and the PJAQ. In this case, reading about crimes could have triggered the related feelings of disgust and punitive attitudes. As mentioned before, those with positive valence weighting

bias are more likely to stick with their initial impulses, so individuals with a positive valence weighting bias may have been more likely to be affected by this priming from the vignettes. This could have then resulted in those with a more positive valence weighting bias expressing more disgust and punitive attitudes than would otherwise be expected. This possibility calls for further studies to explore the relationship between valence weighting bias, disgust sensitivity, and punitiveness.

General Discussion

The aims of these two studies were to replicate and expand upon the relationship between disgust sensitivity and punitiveness, as well as exploring a potentially related variable: valence weighting bias. The results from both studies suggest that disgust sensitivity is a very powerful correlate of punitiveness in juror judgements. Study 1 was intended as an initial replication of past studies that associated disgust sensitivity with punitive attitudes. This was successful, with our chosen measure of juror bias- the Pretrial Juror Attitudes Questionnaire- significantly and positively relating to disgust sensitivity.

The results of Study 2 partially replicated the results of Study 1 and extended the findings to a vignette-based measure of punitive attitudes. More punitive ratings from vignette measures correlated with higher disgust sensitivity. The Pretrial Juror Attitudes Questionnaire also correlated with higher disgust sensitivity. However, the vignettes seemed to measure punitiveness in a more direct way than the PJAQ, and subsequently showed higher correlations with the other included variables. The vignettes were more strongly correlated with punitiveness ratings than Pretrial Juror Attitudes Questionnaire was, so in future studies vignettes might be more useful than the PJAQ. Vignettes also offer a great deal of flexibility in measuring variables

for future studies, for example by altering the vignette actor's race, gender, or other demographics, these variables could be studied in the same mock juror context.

The most unexpected result from Study 2 was the association between positive valence weighting bias, disgust sensitivity, and punitive attitudes. Based on past literature we initially expected that those with a negative valence weighting bias would be higher in disgust sensitivity and thus have more punitive attitudes A possible explanation for the relationship between positive valence weighting bias and more punitive vignette ratings is the association between impulsivity and positive valence weighting bias. As previously mentioned, because the vignettes involved clearly guilty actors, those with positive valence weighting bias may have been more likely to make decisions based on this initial perception of guilt. Those with a negative valence weighting bias may have more closely considered their options and overridden their initial impulses regarding the degree to which the actor should be punished.

The order in which the measures in Study 2 were displayed may have resulted in the unusual relations observed between valence weighting bias, disgust sensitivity and the PJAQ. As the crime-based vignettes were presented before the Three Domain Disgust Scale and the Pretrial Juror Attitudes Questionnaire, participants may have been primed to think about crime before completing measures of disgust and the PJAQ. Jones and Fitness (2008) found that exposing participants to descriptions of criminal behavior triggered increased disgust sensitivity. This increased disgust then led to greater punitiveness against the hypothetical criminals. Thus, by first exposing our participants to the crime-related vignettes, we may have momentarily enhanced disgust sensitivity and punitiveness. Those with a positive valence weighting bias may have been more likely to stick to these initial feelings of disgust and punitiveness, resulting in the

unanticipated association between positive valence weighting bias, disgust sensitivity, and higher scores on the PJAQ.

Valence weighting produced inconsistent findings between our two studies. In Study 1, valence weighting bias was not related to either disgust sensitivity or the Pretrial Juror Attitudes Questionnaire. In Study 2, valence weighting bias was significantly related to TDDS, PJAQ, and our crime vignettes, such that those with a more positive valence weighting bias showed greater disgust sensitivity and more punitive attitudes on the PJAQ. These results were unexpected and in the opposite direction of our hypothesized results. We believe that this unexpected relationship occurred due to those with a more positive valence weighting bias running with their initial impulse to perceive the individuals as guilty. As a result of priming this impulse, individuals with a positive valence weighting bias also showed more punitive attitudes on the PJAQ and greater disgust sensitivity. In future studies, it may be important to include vignettes featuring actors that are not explicitly guilty, or actors that have more ambiguous behaviors. The increased ambiguity of the scenarios might also work to reduce the creation of impulses that may have existed in Study 2. Randomizing the order of measures for each individual participant may help with diminishing order effects. Further research should explore the role of valence weighting bias as related to punitiveness and disgust sensitivity

Importantly, disgust sensitivity was again shown to be significantly associated with both punitive attitudes and decisions. The relationship between disgust and punitiveness has several implications for the criminal justice system. This implies that jurors who have naturally higher disgust sensitivity are more likely to be more conviction-prone and harsher in sentencing, regardless of the details of the case. Thus, assessing disgust sensitivity could be an important

aspect of voir dire. Voir dire is the process of interviewing potential jurors for the purpose of selecting a fair and impartial jury. Potential jurors can be rejected for a number of reasons, such as knowledge of the case, racial biases, or extreme attitudes towards the judicial system. High disgust sensitivity could also be a source of bias that would result in an unfair jury. This could be especially relevant in cases where disgust is likely to be triggered. For example, especially gory crimes could trigger disgust sensitivity and lead to more punitive decisions by the jury. The more images or detail given about the disgusting nature of the crime would most likely continue to increase jurors' willingness to inflict harsh punishment on the defendant. In this case, those with higher pathogen disgust would be predisposed to punitiveness. Similarly, those with high sexual disgust sensitivity could be strongly influenced by sexually disgusting crimes such as pedophilia or rape. Finally, those high in moral disgust may be more likely to be disgusted by crimes that involve transgressions such as lying or cheating. This suggests that high disgust sensitivity should be considered when selecting a jury, as well as during the trial. By limiting the number of disgusting stimuli in the trial, jurors are less likely to become disgusted and thus more punitive, leading to an overall fairer decision.

Future studies should address the inconsistencies in valence weighting bias, and attempt to negate any potential order effects that could cause positively valenced participants to be primed before completing further measures. In addition, expanding the types of vignettes could be useful. As discussed, using vignettes that include actors that are not presumed guilty could lessen the effects of impulsivity and positive valence weighting bias, as well as explore another aspect of juror decision making. The more detail given for each vignette creates a more realistic court case and would better mimic a real-world juror decision. Expanding beyond vignettes

might include asking a participant to watch a video of a court case, which would be even more immersive and applicable to the justice system. The questions following the crime scenarios could also be more realistic. Instead of a Likert scale for how severe a punishment should be, the participants could be instructed in the manner that a juror would be, by being given real sentencing guidelines instead of a more theoretical scale. Validation of these vignettes as a measure for punitive attitudes and decisions allows further customization and exploration of a wide range of variables.

References

Altemeyer, B. (1996). *The authoritarian specter.* Cambridge, MA: Harvard University Press.

Boggs, S. T. (2019). *Danger and disgust: The role of valence weighting bias.* Unpublished manuscript.

Chapman, H. A., & Anderson, A. K. (2014). Trait physical disgust is related to moral judgments outside of the purity domain. *Emotion, 14*(2), 341-348. doi:10.1037/a0035120

Druschel, B. & Sherman, M. (1999). Disgust sensitivity as a function of the Big Five and gender. *Personality and Individual Differences, 26,* pp. 739-748.

Ekman, P. (1970). Universal facial expressions of emotion. *California mental health research digest, 8,* pp. 151-158.

Fazio, R. H., Pietri, E. S., Rocklage, M. D., & Shook, N. J. (2015). Positive versus negative valence: Asymmetries in attitude formation and generalization as fundamental individual differences. In J. M. Olson & M. P. Zanna (Eds.) *Advances in Experimental Social Psychology, 51,* (pp. 97-146). Burlington: Academic Press.

Fazio, R. H., Eiser, J. R., & Shook, N. J. (2004). Attitude formation through exploration: Valence asymmetries. *Journal of Personality and Social Psychology, 87*(3), 293–311. https://doi-org.proxy.lib.ohio-state.edu/10.1037/0022-3514.87.3.293

Faulkner, J., Schaller, M., Park, J., & Duncan, L. (2004). Evolved disease-avoidance mechanisms and contemporary xenophobic attitudes. *Group Processes & Intergroup Relations, 7,* pp. 333-353.

Granados Samayoa, J. A. (2017). On the relation between valence weighting and self-regulation. *Unpublished Manuscript.*

Gromet, D.M. and Darley, J.M. (2011), Political ideology and reactions to crime victims: Preferences for restorative and punitive responses. *Journal of Empirical Legal Studies*, 8: 830-855. https://doi.org/10.1111/j.1740-1461.2011.01242.x

Inbar, Y., Pizarro, D., Iyer, R., & Haidt, J. (2012). Disgust sensitivity, political conservatism, and voting. *Social Psychological and Personality Science, 3*(5), 537–544. https://doi.org/10.1177/1948550611429024

Jones, A., & Fitness, J. (2008). Moral hypervigilance: The influence of disgust sensitivity in the moral domain. *Emotion, 8*(5), 613-627. doi:10.1037/a0013435

Landy, J. F., & Goodwin, G. P. (2015). Does incidental disgust amplify moral judgment? A meta-analytic review of experimental evidence. *Perspectives on Psychological Science, 10*(4), 518–536. https://doi.org/10.1177/1745691615583128

Langworthy, R. H., & Whitehead, J. T. (1986). Liberalism and fear as explanations of punitiveness. *Criminology*, *24*(3), 575-591.

Lecci, L. and Myers, B. (2008), Individual differences in attitudes relevant to juror decision making: Development and validation of the pretrial juror attitude questionnaire (PJAQ).

Journal of Applied Social Psychology, 38: 2010-2038. doi:10.1111/j.1559-1816.2008.00378.x

Liu, Y., Lin, W., Xu, P., Zhang, D., & Luo, Y. (2015). Neural basis of disgust perception in racial prejudice. Human brain mapping, 36(12), 5275–5286. https://doi.org/10.1002/hbm.23010

Miller, M. K., Maskaly, J., Green, M., & Peoples, C. D. (2011). The effects of deliberations and religious identity on mock jurors' verdicts. *Group Processes & Intergroup Relations*, 14(4), 517–532. https://doi.org/10.1177/1368430210377458

Mitchell, T.L., Haw, R.M., Pfeifer, J.E., and Meissner, C.A. (2005). Racial bias in mock juror decision-making: A meta-analytic review of defendant treatment. *Law and Human Behavior* 29, 621–637. https://doi.org/10.1007/s10979-005-8122-9

Neel, R., Kenrick, D. T., White, A. E., & Neuberg, S. L. (2016). Individual differences in fundamental social motives. *Journal of Personality and Social Psychology*, 110(6), 887.

Oosterhoff, B., & Shook, N. J. (2017). From drug laws to recreational substance use: The adaptationist role of disgust sensitivity. *Personality and Individual Differences, 104*, 544-553.

Pietri, E. S., Fazio, R. H., & Shook, N. J. (2013a). Weighting positive versus negative: The fundamental nature of valence asymmetry. *Journal of Personality, 81* (2), 196-208

Pietri, E. S., Fazio, R. H., & Shook, N. J. (2013b). Recalibrating positive and negative weighting tendencies in attitude generalization. *Journal of Experimental Social Psychology, 49,* 1100-1113.

Pizarro, D., Inbar, Y., & Helion, C. (2011). On disgust and moral judgment. *Emotion Review*, *3*(3), 267–268. https://doi.org/10.1177/1754073911402394

Prokop, P., & Fančovičová, J. (2013). Self-protection versus disease avoidance: The perceived physical condition is associated with fear of predators in humans. *Journal of Individual Differences, 34,* 15-23.

Quas, J.A., Bottoms, B.L., Haegerich, T.M. and Nysse-Carris, K.L. (2002), Effects of victim, defendant, and juror gender on decisions in child sexual assault cases. *Journal of Applied Social Psychology,* 32: 1993-2021. https://doi.org/10.1111/j.1559-1816.2002.tb02061.x

Schaller, M. (2006). Parasites, behavioral defenses, and the social psychological mechanisms through which cultures are evoked. *Psychological Inquiry, 17,* 96–101.

Schaller, M., & Duncan, L. A. (2007). The behavioral immune system: Its evolution and social psychological implications. In Forgas, Haselton, & von Hippel (Eds.), *Evolution and the social mind: Evolutionary psychology and social cognitions* (pp. 293–307). New York: Psychology Press.

Schaller, M., & Park, J. H. (2011). The behavioral immune system (and why it matters). *Current Directions in Psychological Science, 20,* 99–103.

Schnall, S., Haidt, J., Clore, G. L., & Jordan, A. H. (2008). Disgust as embodied moral judgment. *Personality and Social Psychology Bulletin, 34*(8), 1096–1109. https://doi.org/10.1177/0146167208317771

Shook, N. J., & Fazio, R. H. (2009). Political ideology, exploration of novel stimuli, and attitude formation. *Journal of Experimental Social Psychology, 45*(4), 995–998. doi:https://doi.org/10.1016/j.jesp.2009.04.003

Stevenson, M.C., Malik, S.E., Totton, R.R. and Reeves, R.D. (2015), Disgust sensitivity predicts punitive treatment of juvenile sex offenders: The role of empathy, dehumanization, and fear. *Analyses of Social Issues and Public Policy, 15*: 177-197. doi:10.1111/asap.12068

Tybur, J. M., Lieberman, D., & Griskevicius, V. (2009). Microbes, mating, and morality: Individual differences in three functional domains of disgust. *Journal of Personality and Social Psychology, 97*(1), 103-112

Wagemans, F. M. A., Brandt, M. J., & Zeelenberg, M. (2018). Disgust sensitivity is primarily associated with purity-based moral judgments. *Emotion, 18*(2), 277–289. https://doi.org/10.1037/emo0000359

Wheatley, T., & Haidt, J. (2005). Hypnotic disgust makes moral judgments more severe. *Psychological Science, 16*(10), 780–784. https://doi.org/10.1111/j.1467-9280.2005.01614.

Zunick, P. V., Samayoa, J. A. G., & Fazio, R. H. (2017). The role of valence weighting in impulse control. *Journal of Experimental Social Psychology, 72,* 32-38. https://doi.org/10.1016/j.jesp.2016.11.014

Appendix A: Tables

Table 1. Mean, standard deviation, Cronbach's alpha, and correlations for all Study 1 variables

	1	2	3	4	5	6	7	8	9	10	11
1. vWB	-										
2. TDDS	.037	-									
3. TDDS_P	.078	.845***	-								
4. TDDS_S	.004	.934***	.597***	-							
5. PJAQ	.120	.448***	.279**	.485***	-						
6. PJAQ_CP	.113	.400***	.247**	.434***	.904***	-					
7. PJAQ_SC	.091	.437***	.267**	.476***	.894***	.795***	-				
8. PJAQ_CTD	.076	.291**	.198*	.304**	.735***	.576***	.550***	-			
9. PJAQ_SJ	.082	.244*	.220*	.218*	.356**	.216*	.130	.423***	-		
10. PJAQ_RB	.081	.221*	.091	.270**	.784***	.742***	.673***	.425***	.065	-	
11. PJAQ_IC	.108	.431***	.260**	.473***	.846***	.696***	.792***	.489***	.126	.592***	-
Mean	0.04	4.22	4.81	3.63	3.00	2.88	3.00	3.39	3.25	2.73	2.74
SD	0.17	1.22	1.09	1.62	0.64	0.97	0.90	0.73	0.56	0.76	0.99
α		.90	.83	.89	.93	.82	.83	.77	-.21	.41	.79

Note. vWB = Valence Weighting Bias, TDDS = Three Domain Disgust Scale, TDDS_P=Three Domain Disgust Scale Pathogen Subscale, TDDS_S=Three Domain Disgust Scale Sexual Subscale, SP= Self-Protection Scale, PJAQ= Pretrial Juror Attitudes Questionnaire, PJAQ_CP=Pretrial Juror Attitudes Questionnaire Conviction Proneness Subscale, PJAQ_SC= Pretrial Juror Attitudes Questionnaire System Confidence Subscale, PJAQ_CTD= Pretrial Juror Attitudes Questionnaire Cynicism Towards the Defense Subscale, PJAQ_SJ Pretrial Juror Attitudes Questionnaire Social Justice Subscale, PJAQ_RB= Pretrial Juror Attitudes Questionnaire Racial Bias Subscale, PJAQ_IC= Pretrial Juror Attitudes Questionnaire Innate Criminality Subscale , *p<.05 ,**p<.01,***p<.001

Table 2. Mean and standard deviation for vignette ratings of action severity and punishment severity

Vignette	Punishment Mean	Punishment SD	Action Mean	Action SD
Lilly enters a pharmacy during the coronavirus pandemic to buy asthma medication. Lilly's asthma makes it difficult to breathe with a mask on, so despite state laws mandating masks and the insistence of store employees, Lily refuses to wear a mask.	2.59	1.662	2.94	1.761
Theresa is addicted to heroin, and she regularly purchases from a dealer on her street. She takes the heroin back to her house to inject it without any other people around.	2.96	1.78	4.05	1.893
Grace recently lost her job and is unable to afford food for herself and her three children. She enters a grocery store and fills a basket with nutritious foods and walks out without paying.	3.04	1.529	3.24	1.524
Lindsey enjoys driving with earbuds in so that she can listen to music. One day she is driving and can't hear the ambulance coming, so she fails to get out of its way until she notices it in her rearview mirror.	3.14	1.689	3.52	1.744
Tom is only 19 years old, but he attends a party at his college and has a large number of beers and gets very intoxicated. When the party is busted by police officers, his driver's license reveals that he is underage to drink alcohol.	3.34	1.72	3.19	1.776

Matthew's six-year-old child is misbehaving, so Matthew spanks his child with a belt. He then sends his child to their bedroom without dinner, as a punishment.	3.62	1.95	4.14	2.098
Janet is bored one night, so she decides to go and spray paint the exterior of a grocery store. She doesn't paint anything vulgar or gang-related, but she does deface the grocery store's property.	3.89	1.305	3.72	1.372
Shane doesn't believe in the coronavirus, so in stores and restaurants he doesn't try to maintain 6 feet of distance from others, and he frequently has parties of over ten people at his house.	4.11	1.815	4.6	1.837
Alexis' husband is physically and emotionally abusive, and one night he was so angry that he slammed her head into a wall. In fear for her life, Alexis waited until he fell asleep and then stabbed him to death with a kitchen knife.	4.42	1.983	5.94	1.527
Barbara is extremely angry to see that her pet dog urinated inside the house. She hits the dog and then puts it outside all night, even though it is wintertime, and the temperature drops below freezing.	5.2	1.661	5.73	1.37
Helen is at a bar and has had several drinks and is noticeably intoxicated. She decides to drive home anyway and continues to drive even after noticing that she is swerving and reacting slowly. At a stop light, Helen brakes too slowly and crashes into the car in front of her.	5.43	1.213	5.67	1.222

Patrick is a high-level drug dealer for his gang. He sells meth, heroin, and crack to people in his neighborhood, and brings the profits back to his gang.	5.52	1.549	5.62	1.537
George waits outside a large house until all the residents to leave for work, and then he breaks the back window and enters the home. He goes room to room, pocketing any valuables he finds so that he can sell them later at a pawn shop.	5.63	1.108	5.7	1.153
Richard has been entrusted with thousands of dollars to invest for his clients. He uses a portion of their funds to buy himself a new car instead of investing the money as he promised.	5.72	1.261	5.64	1.284

Table 3. Mean, standard deviation, Cronbach's alpha, and correlations for all Study 2 variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. vWB	-														
2. Punitiveness	.224**	-													
3. Punishment	.238**	.964***	-												
4. Actions	.173*	.966***	.862***	-											
5. TDDS	.195*	.512***	.537***	.479***	-										
6. TDDS_P	.163	.421***	.445***	.389***	.797***	-									
7. TDDS_S	.168*	.282**	.334***	.241**	.782***	.499***	-								
8. TDDS_M	.120	.442***	.446***	.436***	.697***	.355***	.243**	-							
9. PJAQ	.184*	.319***	.436***	.256**	.391***	.397***	.306***	.194*	-						
10. PJAQ_CP	.045	.342***	.426***	.289**	.373***	.339***	.318***	.202*	.843***	-					
11. PJAQ_SC	.215*	.275**	.383***	.219*	.367***	.350***	.313***	.176*	.819***	.757***	-				
12. PJAQ_CTD	.142	.185*	.278**	.154	.245**	.251**	.158	.153	.769***	.466***	.418***	-			
13. PJAQ_SJ	.108	.121	.158	.110	.144	.166	.086	.076	.219**	.018	-.107	.276*	-		
14. PJAQ_RB	.128	.116	.223**	.058	.197*	.263**	.136	.069	.695***	.536***	.534***	.439***	-.044	-	
15. PJAQ_IC	.151	.242**	.370***	.180*	.268**	.290**	.259**	.064	.790***	.653***	.671***	.481***	.098	.509***	-
Mean	0.01	4.31	4.19	4.51	3.92	4.24	3.10	4.30	2.82	2.55	2.76	3.16	3.33	2.46	2.36
SD	0.19	0.88	0.94	0.92	1.11	1.35	1.57	1.46	0.58	0.92	0.88	0.78	0.63	0.74	0.81
α		.92	.85	.85	.91	.89	.89	.92	.88	.78	.83	.77	.15	.48	.63

Note. vWB = Valence Weighting Bias, Punitiveness= Avg of Punishment Ratings + Actions Ratings, Punishment= Avg of Punishment Ratings, Actions= Avg of Actions Ratings, TDDS = Three Domain Disgust Scale, TDDS_P=Three Domain Disgust Scale Pathogen Subscale, TDDS_S=Three Domain Disgust Scale Sexual Subscale, TDDS_M= Three Domain Disgust Scale Moral Subscale, PJAQ= Pretrial Juror Attitudes Questionnaire, PJAQ_CP=Pretrial Juror Attitudes Questionnaire Conviction Proneness Subscale, PJAQ_SC= Pretrial Juror Attitudes Questionnaire System Confidence Subscale, PJAQ_CTD= Pretrial Juror Attitudes Questionnaire Cynicism Towards the Defense Subscale, PJAQ_SJ Pretrial Juror Attitudes Questionnaire Social Justice Subscale, PJAQ_RB= Pretrial Juror Attitudes Questionnaire Racial Bias Subscale, PJAQ_IC= Pretrial Juror Attitudes Questionnaire Innate Criminality Subscale, **p*<.05 ,***p*<.01,****p*<.001